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Impact of vision rehabilitation on quality of life for older adults with vision loss

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CLINICAL SCENARIO: Bob is a 97 year old male with moderate to severe age-related macular degeneration (AMD). He and his wife live independently in a one-story home, and he is remarkably healthy for his age. He sees his primary physician for regular visits and would be considered a compliant patient. Although he and his family complain that his vision loss has led to decreased occupational engagement he has never been referred to occupational therapy or vision rehabilitation. Bob's family wonders if these services could have been offered at the time of diagnosis to maintain his quality of life and level of participation throughout the disease process.

FOCUSED CLINICAL QUESTION: Is low vision rehabilitation effective in improving psychosocial and functional outcomes for older adults with vision loss?

SUMMARY of Search, "Best Evidence" Appraised, and Key Findings:

- 5 research articles investigating the efficacy of vision rehabilitation were reviewed.
- The randomized controlled trial by Pankow, Luchins, Stedebaker, and Chettleburgh (2004) was deemed the "best evidence." The study concluded that customized intervention is ideal for improving psychosocial outcomes and maintaining functional independence for older adults.
- The phenomenological study by Teitelman and Copolillo (2005) thoroughly analysed the psychosocial experience of older adults with vision loss. The researchers determined that occupational engagement is a major indicator of subjective mental health outcomes.
- Hinds, et al. (2003) performed a before and after study on adults with vision loss. They found improvements in certain measures of ADL performance and quality of life up to 6 months after intervention.
- The before and after study performed by Wolffsohn and Cochrane (2000) detailed the development of a low vision quality of life questionnaire (LVQOL) as well as the efficacy of interdisciplinary low vision rehabilitation. They concluded that the LVQOL was reliable and valid and that vision rehabilitation was correlated with gains in quality of life measures.
- Scott, Smiddy, Schiffman, Feuer, and Pappas (1999) evaluated the impact of low vision services using a before and after study design. They found improvements in perceived functional performance and quality of life. They also determined that vision-specific assessments were more sensitive to changes than general assessments.

CLINICAL BOTTOM LINE: The evidence shows great variation among vision rehabilitation services in terms of treatment offered and healthcare professionals involved. However, vision rehabilitation is consistently correlated with increased quality of life measures for older adults with low vision. This is an emerging practice area for occupational therapists as they are uniquely qualified to offer rehabilitation services.

Limitations: This CAT was written by an occupational therapy student as a course assignment and has not been peer-reviewed. An exhaustive search of the literature was not conducted.

SEARCH STRATEGY

Terms used to guide Search Strategy:

- **P**atient/Client Group: Older adults with low vision
- **I**ntervention (or Assessment): Vision rehabilitation services
- **C**omparison: Null
- **O**utcome(s): Increasing psychosocial and functional measures

Table 1: Summary of Audit Trail

Databases and Sites Searched	Date Searched	Search Terms	Limits Used	Number of Articles Found
CINAHL	09/2010	"occupational therapy" AND "low vision" AND "older adults"	N/A	5
CINAHL	09/2010	"outcomes" AND "low vision" AND "older adults"	N/A	2
CINAHL	09/2010	"independent living" AND "older adults" AND "occupational therapy"	N/A	14
CINAHL	09/2010	"low vision" AND "quality of life"	N/A	64
CINAHL	09/2010	"vision rehabilitation" AND "quality of life"	N/A	75

INCLUSION and EXCLUSION CRITERIA

- Inclusion:
  - Peer reviewed articles
  - Available in English
  - Participants with vision loss
  - Adult participants (majority above 60 years old)
  - Full-text available

- Exclusion:
  - Neglecting psychosocial outcomes
  - Published prior to 1999

RESULTS OF SEARCH

Five relevant studies were located and categorized as shown in Table 2 (based on Levels of Evidence, Centre for Evidence Based Medicine, 1998)

Table 2: Summary of Study Designs of Articles Retrieved

Study Design of Articles Retrieved	Level	Number Located	Author (Year)
Randomized Controlled Trial	II	1	• Pankow, L., Luchins, D., Studebaker, J., & Chettleburgh, D. (2004). Evaluation of a vision program for older adults with visual impairment. *Topics in Geriatric Rehabilitation, 20* (3), 223-232.
Before and After	III	3	• Hinds, A., Sinclair, A., Park, J., Suttie, A., Paterson, H., & Macdonald, M. (2003). Impact of an interdisciplinary low vision service on the quality of life of low vision patients. *British Journal of Opthamology, 87,* 1391-1396. • Scott, I. U., Smiddy, W. E., Schiffman, J., Feuer, W. J., & Pappas, C. J. (1999). Quality of life of low-vision patients and the impact of low-vision services. *American Journal of Ophthalmology, 128,* 54-62. • Wolffsohn, J., & Cochrane, A. (2000). Design of the low vision quality-of-life questionnaire (LVQOL) and measuring the outcome of low-vision rehabilitation. *American Journal of Ophthalmology, 130,* 793-802.
Qualitative (Phenomenology)	N/A	1	• Teitelman, J. & Copolillo, A. (2005). Psychosocial issues in older adults' adjustment to vision loss: Findings from qualitative interviews and focus groups. *American Journal of Occupational Therapy, 59,* 409-417.

BEST EVIDENCE

The following study by Pankow et al. (2004) was identified as the "best evidence" and selected for critical appraisal. Reasons for selecting this study were:

- High level of evidence (II)
- Most recent (2004) quantitative study reviewed
- Addressed the clinical question
- Focused only on an older adult population
- Occupational therapy included in interdisciplinary team
- Looked at quality of life in terms of functional and psychosocial outcomes

SUMMARY OF BEST EVIDENCE

Table 3: Study Description and Critical Appraisal of *Evaluation of a Vision Program for Older Adults with Visual Impairment* by Pankow et al. (2004)

Study Description	**Aim/Objective of the Study:** This study was performed in response to a lack of controlled research about the effects of vision rehabilitation for older adult populations. The researchers sought to find the change in functional independence and psychological well-being for older adults participating in a client-centered vision rehabilitation program. **Study Design:** This was a randomized controlled trial in which 30 participants were divided into treatment and control groups. Participants and researchers were not blind to grouping. Outcomes were measured approximately 4 weeks pre- and post-intervention. **Setting:** Intervention was provided through Northern Indiana Independent Living Services. Vision rehabilitation was provided at participants' individual homes. **Participants:** A sample of 30 participants was gathered from individuals interested in receiving services from the studied vision rehabilitation agency. They were asked to participate based on the following inclusion criteria: • at least 55 years old • first time seeking vision rehabilitation services • sufficient cognition (based on accuracy of intake questions) • stable acquired visual impairment (best corrected visual acuity of 20/50 or worse) The age range of the sample was 65 to 90 years old and all participants were Caucasian. The visual impairments represented by the sample were hemianopsia, retinal detachment, macular degeneration, pituitary gland tumor, quadrantopsia, cerebral vascular accident, and diabetic retinopathy. Detailed descriptions of all participants are provided in the article. Participants were randomly assigned to either the treatment or control groups. Half of the treatment group was legally blind while the majority (12 of 15) of the control group was legally blind. Additionally, more of the treatment participants than the control participants had hemianopsia. The following covariates were analysed between groups: time between pre-test and post-test, age, number of participant's children living in the local area, number of visual diseases secondary to the primary cause of vision loss, days of illness experienced by participant in 6 months preceding study enrolment, number of people living with participant, social support, presence or absence of hearing impairment, and presence or absence of public bus transportation a block from the participant's home. Institutional Review Board approval was obtained prior to performing any research for this study and all participants gave informed consent. Also, control participants were able to receive vision rehabilitation services after the research was conducted, spending a total of no more than 8 weeks on the waiting list for services. One member of the control group was eliminated from the outcome calculations on the basis that she moved into a nursing home where she received supplemental occupational therapy intervention.

	Intervention Investigated: *Control:* The control group was put on a maximum of 8 week long waiting list to receive vision rehabilitation treatment from the program. Participants in the control group were given general education about their vision impairment and demonstration of optical and non-optical aids while waiting for rehabilitation. *Experimental:* The treatment group received specialized blind-rehabilitation teaching, orientation and mobility training, driver rehabilitation, occupational therapy, and prism training depending on client goals and level of impairment. Blind-rehabilitation training was provided by a specialist with a master's degree in blind-rehabilitation teaching. Teaching was done primarily using modification techniques such as labelling and using tactile alternatives. Similarly, orientation and mobility training was provided by a specialist with a master's degree in orientation and mobility teaching. This included using mobility aids and other assistive devices. Occupational therapy services provided additional training with assistive devices (primarily prism training) and were mostly aimed at the post-stroke hemianopsic population. A certified driver rehabilitation specialist addressed all treatment goals related to driving. The resident optometrist/psychiatric social worker vision rehabilitation specialist performed visual acuity testing. Goals were developed in conjunction with the vision rehabilitation clinicians and the participants. Individual length of rehabilitation varied and is noted for each client. **Outcome Measures:** Living skills and orientation and mobility skills were evaluated using the Functional Independence Measure for Blind Adults (FIMBA). There are no data for reliability or validity of this measure; however, the authors performed a Cronbach α test of internal reliability with the data gathered. Internal reliability for the living skills section and orientation and mobility skills section of the scale was 0.96 and 0.90, respectively. A blind rehabilitation/orientation and mobility instructor administered the FIMBA. Depression, anxiety, self-esteem, acceptance of disability, adaptation to disability, and self-efficacy were measured using the Nottingham Adjustment Scale 2 (NAS2). This assessment is specific to vision loss. It has 60 questions using a 5-point Likert scale with a maximum of 300 points available. Validity and reliability data are available for this assessment. Internal reliability varies from 0.90 to 0.93. An optometrist/psychiatric social worker vision rehabilitation specialist administered the NAS2. Goals were measured as met or not met based on the measurable factor of individual goals. For example, a goal of improved reading speed was considered attained if the clients reading speed (in words/min) increased from pre- to post-test. **Main Findings:** The results of the study indicated that the treatment group had statistically significant score gains compared with the control group for the FIMBA Living Skills inventory and the NAS2. However, there was not a significant difference between the groups for the FIMBA Orientation and Mobility (O & M) section. Also, the treatment group met 29 of 30 goals whereas the control group met 1 of 30 goals. All significance levels were for $p<0.001$. Statistical analysis was done using univariate analysis of covariance (ANCOVA). Results are summarized in Table 4.

Table 4: Means and Standard Deviations for Pre-test and Post-test Scores on Outcome Measures

Measure	Group	Test	Mean	Standard Deviation
NAS2	Treatment	Pre-test	225	22
NAS2	Treatment	Post-test	222	21
NAS2	Control	Pre-test	207	33
NAS2	Control	Post-test	209	31
FIMBA Living	Treatment	Pre-test	118	21
FIMBA Living	Treatment	Post-test	132	11
FIMBA Living	Control	Pre-test	104	31
FIMBA Living	Control	Post-test	120	23
FIMBA O & M	Treatment	Pre-test	136	29
FIMBA O & M	Treatment	Post-test	144	16
FIMBA O & M	Control	Pre-test	136	41
FIMBA O & M	Control	Post-test	139	31

Original Authors' Conclusions: Gains in subjective and objective outcome measures are likely correlated with the collaborative goal setting and customized intervention provided with vision rehabilitation services. This research supports legislative initiatives to change public policy to broadly cover vision rehabilitation.

Critical Appraisal

Validity: The study purpose was clear and the research design was appropriate to answer the clinical question. All relevant background literature was reviewed. Blind evaluation was not possible; however the researchers attempted to control for this bias by restricting the availability of pre-test scores during post-testing. Participants reported that confounding factors such as other medical or social issues impacting their response to feelings of anxiety and depression on the NAS2 psychosocial assessment. Although participants were selected and grouped randomly, the subject pool was of limited diversity. The assessment tools were relevant to clinical research, but the FIMBA has little research validating it as an assessment tool and does not include driving as an area of functional mobility. The latter is problematic because a large portion of treatment was aimed at regaining independence in driving. Inclusion of a driving specific assessment would improve the overall validity of the study. While it was clear that participants were involved in treatment for at least 4 weeks, there was no indication of the frequency or breadth of intervention. Specific lengths of treatment and interventions provided are listed in detail within the article. Because all intervention was based on client-centered goals, treatment could only be replicated in broad sense. For instance, occupational therapy may be provided in a replication, but there would be no guarantee of the similarity of services offered between the two studies.

Interpretation of Results: The authors performed a well-thought and thorough randomized controlled trial to demonstrate the efficacy of a specific client-centered vision rehabilitation program. They identified relevant limitations of the study; however, did not address how these limitations could be accounted for in future research. Overall, the results are very much in favor of vision rehabilitation for low vision populations. The significant gains in goal attainment are particularly important from a clinical perspective. More recent

	controlled studies were not found during a search of the literature, indicating that this is still the "best evidence" regarding the efficacy of vision rehabilitation for an older adult population. **Summary/Conclusion:** For individuals suffering from uncorrected vision loss, quality of life and ability to participate are of the utmost importance. Although this study had noted limitations, it serves as valid evidence that vision rehabilitation can improve psychosocial and functional outcomes for older adults with low vision. Further research is needed, but preliminary results suggest referrals to vision rehabilitation are appropriate for this population. Additionally, the research offers support for third party reimbursement of low vision services.

Table 5: Characteristics of Included Studies

	Hinds et al. (2003)	**Scott et al. (1999)**	**Teitelman & Copolillo (2005)**	**Wolffsohn & Cochrane (2000)**
Intervention Investigated	Low vision rehabilitation (after)	Low vision rehabilitation (after)	N/A (qualitative phenomenology)	Low vision rehabilitation (after)
Comparison Intervention	No low vision rehabilitation (before)	No low vision rehabilitation (before)	N/A (qualitative phenomenology)	No low vision rehabilitation (before)
Purpose/ Method	The study sought to determine the change in quality of life after participants attended an interdisciplinary low vision service. The researchers performed the study in response to findings that indicated a large number of people experiencing vision loss were not receiving adequate care regarding their conditions.	The purpose of the study was to determine if low-vision services offered at a low vision clinic were correlated with an increase in functional status and/or quality of life for clients with vision loss. A secondary purpose was to look at the efficacy of vision-related questionnaires in terms of measuring outcomes for a low vision population.	The study initially investigated the use of assistive devices for older adults with low vision. However, the researchers shifted the focus to the psychosocial implications of vision loss. Personal interviews and focus groups provided a form of group therapy and socialization for the participants as well.	The primary purpose of this study was to develop a vision-related questionnaire about quality of life for individuals with untreatable vision loss. After generating and analyzing the assessment, the authors used it to determine changes in quality of life for individuals receiving vision rehabilitation services.
Outcomes Used	Vision Related Quality of Life Questionnaire (VQOL); Restrictions of Daily Living Questionnaire (MLVQ)	Medical Outcomes Study 36-Item Short Form (SF-36); Visual Function-14 (VF-14); Field Test Version of the National Eye Institute Visual Functioning Questionnaire (NEI-VFQ)	Emotional challenges, negative emotional outcomes, indicators of emotional adaptation	Low Vision Quality of Life Questionnaire (LVQOL)
Findings	The identified interdisciplinary low vision services were effective in improving certain measures of ADL performance and self-reported quality of life for a visually impaired population.	Low vision services can improve patient's perceived functional performance and some measures of vision related quality of life. Low-vision-specific assessments are more sensitive than general health assessments for this population.	Occupational engagement is a major indicator of mental health outcomes for older adults with vision loss.	Low vision rehabilitation services can help improve patients' quality of life scores. Multidisciplinary treatment showed greater gains in outcome measures than treatment from a single discipline.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

Pankow et al. (2004) found significant gains in functional and psychosocial outcome measures as well as goal attainment between clients receiving vision rehabilitation and those not receiving services. Clinically, this suggests that occupational therapy has a strong role in vision rehabilitation because of the profession's tendency to customize care to meet client-centered goals. Nearly all of the client goals were related to functional independence which can be linked to higher quality of life and reduction of health care costs. Before and after studies of a similar scope (Hinds et al., 2003; Scott et al., 1999; Wolffsohn & Cochrane, 2000) also found improvements in quality of life and/or functional independence for a comparable population. Additionally, a qualitative study (Teitelman & Copolillo, 2005) highlighted the importance of psychosocial components in older adults' ability to cope with vision loss. These results generally support the argument that occupational therapy and client-centered rehabilitation can contribute to the care of older adults with low vision from both a psychosocial and functional perspective.

Vision rehabilitation programs exist in Oregon, particularly in the Portland-metro area. However, little education is provided to occupational therapists and/or occupational therapy students regarding these services. Continuing education courses exist on the topic, but it is up to individual practitioners whether or not they wish to attend. The results of this CAT would indicate that more extensive education to therapists is needed to fully and appropriately serve this population. Also, healthcare providers should be more informed about the scope of these services to streamline the referral process.

Further research is needed to address the limitations in the existing vision rehabilitation studies. In particular, researchers should focus on the types of services provided in order to better determine what aspects of rehabilitation are most beneficial to clients. Other future research focuses include changes in outcome on the basis of: diagnosis, social support, age, gender, living status, length of intervention, and frequency of intervention.

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